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AUTHOR Rigsby, Leo C.
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ABSTRACT

This paper explores what researchers have meant when they talk and write about the effects of schooling on the educational performances and educational development of children. First, a literature review illustrates both the lack of consensus about theory and methodology and some reasons for the inconsistent conclusions about school effects. A conclusion is that past research on school effects has devoted too much attention to establishing statistical relationships between underconceptualized measures of school characteristics and student outcomes. Instead, frameworks interpreting the multileveled effects of schooling on student outcomes must be developed. In particular, research is needed that asks the questions: (1) How do schooling processes and structures interact with race and gender to create different learning and opportunity structures?; and (2) To what extent can different school performance patterns be attributed to such interactions? If the interactions among social context, group culture, and individual identification are important, research that ignores them distorts an understanding of the educational process. The most complete understanding of any educational phenomenon will combine multilevel theoretical frameworks with data from a variety of sources. (Contains 44 references.) (LMI)

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A HETERARCHICAL MODEL OF EDUCATIONAL PROCESSES: LOOKING AT THE EFFECTS OF SCHOOLING

Leo C. Rigsby

Associate Professor of Sociology
and
Senior Research Associate
Center for Research in Human Development and Education
Temple University

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Direct inquiries to Leo C. Rigsby, Department of Sociology, Temple University, Philadelphia, PA 19122. This paper has been prepared for delivery at the Annual Meeting of the American Educational Research Association, April 12-16, Atlanta, Georgia. The research reported herein was supported in part by the Temple University Center for Research in Human Development and Education (CRHDE) and in part by the Office of Educational Research and Improvement (OERI) of the U.S. Department of Education through a grant to the National Center on Education in the Inner Cities at Temple University. The opinions expressed do not necessarily reflect the position of the supporting agencies, and no official endorsement should be inferred.

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INTRODUCTION

National commissions on educational policy tell us that our schools are in trouble. Implicit in these pronouncements is the idea that schools could do, or have in the past done, a much better job in educating America's children and youth. If schools are better or worse at educating children in different times or places, it must be possible to conceptualize and measure the effects of schools or schooling on children's learning and development. I take it as a given that thinking about the effects of schools on learning must be embedded in some more general understanding about how children learn and of the many levels of influence on their educational development.

This paper will explore what researchers have meant when they talk and write about the effects of schooling on the educational performances and educational development of children. Surprisingly, there is little consensus on this issue either in terms of theoretical specification or in terms of appropriate methodological strategies. I will illustrate both the lack of consensus and some reasons for inconsistent conclusions about school effects with a brief review of existing literature. Then I will turn to a discussion of important issues that must be addressed in order to articulate multi-level theories of the effects of schooling.

LITERATURE

Perhaps the most influential sociological research program which has addressed the issue of school effects is the status attainment research program that developed around the work of William Sewell, Robert Hauser, and their collaborators at the University of Wisconsin beginning in the late 1950s (Rigsby 1992; Shea 1976; see Sewell and Hauser 1980 for a comprehensive overview of the program). The Wisconsin researchers studied the 1957 graduating class from high schools

throughout Wisconsin. Focusing on social psychological relationships and processes relating to school achievement, they studied achievement stages in the life cycles of individuals. Researchers working in this program marshalled impressive evidence from the Wisconsin data on the relative effects of the socioeconomic aspects of family background, scholastic performance, educational and occupational aspirations, and influences from significant others. Their model of the social psychological processes of schooling remains the most fully elaborated and well corroborated model in the literature. A major conclusion from this work is that differences between schools, operationalized with a socioeconomic status index aggregated to the level of the neighborhood served by the high school, have very little impact on student outcomes (Sewell and Armer 1966; Sewell and Hauser 1980). This measure of the normative climate of the neighborhood of residence was introduced into their analysis to characterize normative influence on all students in a given school.

Other researchers have employed more explicitly theorized conceptions of school climate (McDill, Meyers, and Rigsby 1967, 1969; McDill and Rigsby 1973) or measures of curriculum tracking (Alexander and McDill 1976; Alexander, Cook, and McDill 1978; Alexander and Eckland 1975; Hauser, Sewell, and Alwin 1976; in a very different research tradition see Oakes 1985) in attempting to assess school effects on student outcomes. These studies have reported somewhat larger effects of "school" though the effects are still limited to between-school or between-track differences in achievement.

A second important body of research that complements the conclusions of the status attainment program on school effects grows out of the Equality of Educational Opportunity survey conducted under the direction of James Coleman and a number of collaborators (Coleman, et al. 1966). This massive study of educational opportunity in the United States was charged with examining the extent of inequality in access to schooling resources due to race. For our purposes, some of the major conclusions were:

1. school characteristics (especially per/pupil expenditure, characteristics of school staff, and school facilities) showed little effect on student achievement
2. family background characteristics showed the greatest effects on student achievement,
3. the school characteristic with the greatest effects on student achievement was the social background (race and socioeconomic status) of fellow students

The data from the Coleman report have been extensively re-analyzed and the results critically analyzed and challenged. For example, Bowles and Levin (1968) have argued that the underrepresentation of large cities in the sample and the measurement of school characteristics at the district rather than school level, invalidate the Coleman Report's conclusion that school characteristics make no difference. Secondly, a number of critics have pointed to research design flaws as producing an overestimate of the effects of family background (Bowles and Levin 1968; Hanushek and Cain 1972; Spady 1976). Even the meaning of the relationship between the socioeconomic and racial backgrounds of fellow students and the achievement of minority students has also been challenged as being an artifact of sampling and measurement (Wilson 1968; Bowles and Levin 1968).

These criticisms notwithstanding, the massive literature based on the Coleman Report data concludes that schools per se (which in this research means differences between schools in programs, policies, expenditures, personnel, etc.) account for no important differences in student outcomes (Jencks et al. 1972; Mosteller and Moynihan 1972).

Much of the research mentioned above is vulnerable to problems ably discussed by Bidwell and Kasarda (1980). They point out that in this tradition of research the statistical model is typically an analysis of covariance where measurement of all variables is at the level of the individual and the only variance that "school" can explain is the "between-schools" variance. Bidwell and Kasarda (1980) point to a number of problems with this approach. First, the approach conflates what they call the effects of schooling (the effects of allocation of resources--personnel, time, and materials) with the

effects of school (the effects of between school differences). In other words this approach ignores the common elements of learning produced by schools and calls school effects only those unique elements that are associated with between school means. Second, to accept the model, one must assume that the experiences of children within schools are essentially the same. The model implies that no important variation exists in experience within schools; that is that classrooms, tracks, and/or programs within schools offer the same experience. The now vast literature on tracking (see Oakes 1985, 1992 for a discussion of this research) and on special education placements (Wang _____) challenges such an assumption. Third, the model in giving precedence to individual level explanatory factors (socioeconomic status, previous performance record, gender, race, etc.) confounds these with inappropriately measured school-level factors. That is, to the extent that later classroom or program placement (tracks, ability groupings, etc.) is a function of earlier performance, then the individual level predictors of scholastic success will become more and more correlated with measures of school program. Spady (1976) makes similar points about researching school effects.

Thus, the conclusion that school effects are small or non-existent is in part a consequence of the methodological commitments and fundamentally individualistic orientation of the research. These results are built on an assumption that the impact of structural processes, other than the direct influence of significant others on students' values and aspirations, must be secondary to individual-level processes. Under this view, when higher-level contextual phenomena are included in research in this tradition, the methodological operations give precedence to individual-level phenomena and treat the structure as a linear, additive individual characteristic. (See Hauser 1969, 1970 for a clear and interesting statement of the issues and rationale.) The assumption is that the effects of school structure, community structure, curriculum (ability group or track), etc., can only be acceptably demonstrated as additive effects only after all relevant individual characteristics have been properly controlled or accounted for. Individual characteristics have precedence over structural characteristics.

Similarly, characteristics which from a structural perspective may delimit qualitative group differences in socialization, opportunities, and political interests, are instead interpreted to be individual level (biological?) traits. Thus, for example, race and gender are conceived to be characteristics of person/personality, rather than as markers of structural constraints which condition the causal powers of personality, family, peer associations, and so forth.

On another side of the "effects of school" controversy are a number of researchers who have studied or synthesized studies of school-level or classroom-level activity, and who conclude that schools make or can make an important difference in children's learning (Brookover et al. 1979; Purkey and Smith 1983; Holmes 1989; Walberg 1986; Wang, Haertel, and Walberg 1990). They claim to have isolated five or six factors that characterize effective schools. Stedman (1987), somewhat a critic of this research program, identifies these as being: 1. strong leadership by the principal, particularly in instructional matters; 2. high expectations for school achievement on the part of teachers; 3. an emphasis on basic skills; 4. an orderly environment; 5. the frequent, systematic evaluation of students; and 6. increased time-on-task. These researchers make assumptions about schooling and learning processes that are opposite those of the "no school effects" group. Their research seldom includes the controls for individual-level variables considered so important in the rival camp. Despite the recency of this literature relative to the "no school effects" literature, one cannot conclude that its case is adequately demonstrated since most of the studies are at the level of the school or the classroom and do not take into account the past learning experiences of the children involved.

Thus, the older body of literature (e.g., the status attainment program and work growing out of the Coleman Report) emphasizes student and family diversity and assume/concludes that schools and programs are essentially homogeneous. The newer body of literature emphasizes school and program diversity and treats students as if they were homogeneous.

Even the most recent literature on this issue remains inconclusive. Stedman (1985, 1986, 1987, 1988) has questioned whether "effective schools" researchers have sufficient evidence to support their claims to have isolated the crucial characteristics of effective schools. Stedman argues that studies cited to support the conclusions of the effective schools movement are flawed in two important ways. First, the "supporting" studies often cited evidence on improvement of student test scores when the "improved" scores were still "several years below grade level" (1987, p. 216). Second, many of the studies report correlations of the six effective factors with student performance reflecting relationships that are opposite those posited by effective schools logic. Stedman (1987) extracts a different set of key school characteristics in elementary schools with a record multi-year of improving the performance of the lowest performing students: 1. ethnic and racial pluralism; 2. parent participation; 3. shared governance with teachers and parents; 4. academically rich programs; 5. skilled use and training of teachers; 6. personal attention to students; 7. student responsibility for school affairs; 8. an accepting and supportive environment; and 9. teaching aimed at preventing problems.

Brookover (1987), a key researcher in the effective schools movement, disputes Stedman's criticisms. The debate does not focus on <u>whether</u> characteristics of schools make a difference in student outcomes as much as on <u>which</u> characteristics make a difference. Neither researcher addresses the question that status attainment researchers would pose: Can you demonstrate that these characteristics of schools make a difference in learning by students, when taking account of their personal characteristics and social influences? One could pose a second challenge: Are the putative effects of school characteristics the same for all groups and conditions, or do they operate differently for different groups and/or conditions? On this latter score, Firestone and Herriott (1982) have argued that organizational differences between elementary and secondary schools make it problematic to apply knowledge or experience from research on the former to program development on the latter.

This description of the controversy over school effects is greatly simplified, as evidenced by the work on the High School and Beyond data completed by Coleman and his collaborators (Coleman, Hoffer, and Kilgore 1982; Hoffer, Greeley and Coleman 1985; Coleman and Hoffer 1987) and by their critics (see comments on their work, and contrary arguments, in the April/July1982; October 1983; and April, 1985 issues of Sociology of Education) While these researchers do incorporate measures of both student and schooling diversity in their attempts to understand the schooling performances of American high school students, the "school effects" analysis has focused on sector (public, religious, and private) and global measures of school and student peer climate (the availability of honors or advanced courses, time spent on homework, attendance patterns, disciplinary climate, and aggregate measures of student behaviors--cutting class, absenteeism, fighting, and threats to teachers). Further, the school-level measures like the school-level measures used in the status attainment research and analyses of the Coleman Report data are measured at the school level but treated as individual level data. In addition, the measures still fail even to begin to capture the richness of what goes on in classrooms and programs and in interpersonal networks. Without glossing over the complexity of assessing school effects arising from within-school structures and processes, it is important to emphasize that there is every reason to believe that classrooms and other such instructional units and interpersonal networks are likely to be productive and non-trivial units of analysis in research on the effects of school features on student learning and development.

A final body of literature I should mention here is that which is developing around a relatively new research strategy--hierarchical linear models (Raudenbush and Bryk 1986; Bryk and Raudenbush 1988; 1992). These are statistical models that allow one to assess multiple levels of influence on, say, student achievement by examining the effects of classroom or school level structures and processes on the structures of relationships among individual level variables. Stated differently, coefficients from a regression of student achievement on individual level variables become input to an

analysis of program or school level variables. It is assumed that program or school level phenomena can have effects on the structure of relations among individual level variables (may affect the relationship between socioeconomic status and achievement, for example).

These models have been used to explore a controversy from Coleman, Hoffer, and Kilgore's (1982) original analysis of the High School and Beyond data (Lee and Bryk 1989; Raudenbush and Bryk 1986). Coleman, Hoffer, and Kilgore (1982) argued that Catholic schools more closely resembled "the common school" because the relationship between social background and student achievement is weaker in Catholic schools (implying that these schools enable students to overcome their social origins) than in public schools (where social background is reproduced through its connections to academic performance). Hierarchical linear models (HLM) surmount the major flaws of covariance models--aggregation bias, misestimated standard errors, and heterogeneity of regression (Lee and Bryk 1989). Analyses based on HLM have
reinforced, but also caused a re-interpretation of, earlier arguments that the characteristics of schools do have important effects on student achievement.

DISCUSSION

Definitive answers on whether school characteristics are important causes of differences in student achievement have not been established, however. A number of issues must be considered if we are to reconceptualize school effects in ways that will be useful for empirical research. First and foremost is the clarification, following Bidwell and Kasarda (1980), of the distinction between the effects of schools (between-school differences) and the effects of schooling (the differential allocation of resources within instructional units). Moving beyond current research practice in all the research programs mentioned earlier, we argue that it is inadequate simply to search for statistical relationships

among measures of structures and student outcomes. An explicit multi-level theoretical framework must be provided within which to search for and interpret relationships.

A second related issue is that many of the features of schools, tracks and programs, classrooms, and instructional groups that we think are efficacious for student learning are correlated with each other. In some cases it becomes almost arbitrary to attribute causal power to structures at any particular level (Spady 1976). Only with the help of strong theoretical arguments supplemented with information from detailed observations of instructional settings, can we interpret statistical evidence on the effects of schooling. In addition, as we already mentioned, school effects become increasingly confounded with the effects of individual level characteristics, especially at the secondary level where students are assigned or choose particular programs based in part on past performance and/or the cultural capital of socioeconomic status.

A third problem is that present school performance of students, as measured in any survey project (such as the EEO study, High School and Beyond, NLS, or NELS88), reflects not only the effects of the present context of learning, but past learning experiences and past contexts of learning, all of which may be heterogeneous. If, for example, we believe the nature of the relationship between a child and her teacher exercises an important influence on her learning mathematics, do we look only at the present teacher-child relationship or include measurements on past relationships with math (and other) teachers?

When our conception of particular school effects makes the program-level and/or school-to-school differences the focus of attention, we must attend to whether all students have equal exposure to the school feature of interest and/or that schools with similar resources use these resources in similar ways. If these are unwarranted assumptions, we are not assessing the effects that we hoped to assess. I will cite two examples where homogeneity of exposure has been questioned. Rigsby and McDill (1975) argue that peer influences on academic performances may come from several levels

simultaneously. For example, students with stronger scholastic commitments may band together for support and protection regardless of whether the school they go to is largely intellectual or anti-intellectual. Their immediate friends probably have more influence on their schooling behaviors than will the broader social climate of the school. On the other hand, a group of scholastically motivated students may be leaders in one setting and outcasts in another. The larger climate may affect their degree of engagement/alienation, but not their actual grade and test performance. (See Brown 1990 for similar arguments.)

Oakes (1992) puts forth a powerful argument for multi-level effects of tracking on students' performances. She cites studies of curriculum and instruction differences across program tracks in high schools, showing that:

> . . . track placements (and parents' success at influencing them) stem from factors beyond students' characteristics. Differences among schools--such as size of various tracks, entry criteria for particular tracks, and scheduling practices--all affect the likelihood that a student with particular characteristics will be placed in particular classes. . . .(p. 14)

These are the kinds of structural influences on students' schooling performances that must be explicated and subjected to rigorous empirical assessment. A vast amount of work has been done with more recent data sets to untangle the complex effects of tracking at the high-school level. Oakes (1985) book Keeping Track contains a useful and provocative account of an important effort in this literature.

To summarize these issues, a problem with past research on school effects is that too much attention has been devoted to establishing statistical relationships between (1) underconceptualized measures of school characteristics and 2) student outcomes. More effort needs to be devoted to carefully working out frameworks for interpreting multi-leveled effects of school on student outcomes. In particular, research is needed that asks the question: How do schooling processes and structures interact with race and gender to create different learning and opportunity structures? To what extent

can different school performance patterns be attributed to such interactions?

CONCLUSIONS

There are important implications of the argument made here for the conduct of social science research on educational processes and outcomes. If the interactions among social context, group culture, and individual identification are as important as I think, research which ignores them distorts our understanding of educational processes. Research aiming to find the single most parsimonious model is misguided in the sense that it must represent an averaging of model coefficients for different groups which may be very different. Further, such a strategy implies that a model representing developmental and schooling processes for groups in the study population are equally meaningful and applicable to understanding such processes for other groups. This practice assumes there are universal laws of human development and human behavior transcending time and cultural context, an assumption which has been challenged (Rigsby 1992; Mehan 1992).

Virtually no previous research has simultaneously addressed several of these levels, let alone all of them. If it is true, as elsewhere argued (Rigsby 1992), that influences on schooling performances and educational development of adolescents interact across levels, then we must begin to formulate research projects that address multiple levels. We can no longer allow the convenience of statistical models and measurement models to dictate research operations. One reason educational research has had a limited impact on educational policy is that research operations have been too fragmented and simplistic. One exemplary research effort which does address multiple levels of school performances, and has dramatic policy implications, is the work of Oakes. Her article on tracking (1992) is an outstanding example of multi-level analysis of an educational process. Only by combining research of several styles (survey, observation, and quasi-experimental), was she able to

reach such compelling and powerful conclusions. Her work also illustrates an important final point from our earlier work (Rigsby 1992), i.e., that the most complete understanding of any educational phenomenon will combine multi-level theoretical frameworks with data from a variety of sources. Theoretical analysis will play a crucial role in constructing the understanding.

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